

²³~~75~~. A module comprising a plurality of semiconductor chip assemblies as claimed in claim 1, and a substate having contact pads thereon, the chip and sheetlike element of each said assembly overlying said substrate with the sheetlike element of each said assembly being disposed between the chip of such assembly and said substrate, said terminals of said assemblies being connected to said contact pads of said substrate.

SUB C
76. A semiconductor chip assembly as claimed in claim 67 further comprising a substate having contact pads thereon, said sheetlike element being disposed between said chip and said substrate, each said terminal being connected to one said contact pad of said substrate.

1017
77. A semiconductor chip assembly as claimed in claim 68 further comprising a substate having contact pads thereon, each said terminal being connected to one said contact pad of said substrate.

26-78. A component as claimed in claim 15 wherein said compliant layer includes an elastomeric material.

27-78. A component as claimed in claim 15 further comprising flexible leads electrically connected to said terminals, each said flexible lead having a contact portion remote from the associate terminal adapted for connection to a chip.

28-80. An elongated tape comprising a plurality of components as claimed in claim 17 connected to one another.

REMARKS

In response to the Official Action mailed February 24, 1995, Applicant hereby elects the claims of Group I (claims 1-6, 15-35 and 61-65) for prosecution in the present application. The claims of Group II have been cancelled. Such cancellation is not intended as a disclaimer of the Group II claims; applicant reserves the right to pursue such claims via a divisional application.

Of the elected Group I claims, claims 22-35 have been cancelled as redundant in light of applicant's previously-issued United States Patents 5,148,265; 5,148,266; 5,258,330; 5,346,861 and 5,347,159.

The claims have been amended from to US format (e.g., "wherein" rather than "further characterized..."). Claim 1 has been modified to delete the statement of "resilient means" at the end of the claim and to state that the sheetlike element "bears upon" the surface of the chip. This recitation is set forth in the specification at, e.g., page 26, line 13 of the specification. The drawings (e.g., Figs. 2, 13 and 14) also show the sheetlike element or interposer bearing on the surface of the chip. Claim 2 has been modified for conformity with claim 1. Claim 61, previously added by amendment, has been amended to recite a "compliant layer"; claim 63 has been amended for conformity.

New independent claim 67 has been added; this claim states explicitly that the sheetlike element overlies the "front" or contact-bearing surface of the chip. It includes the recitation of "a layer of a compressible material", (supported by original claims 2-3). New claim 68 is similar, but is directed to the structure in which terminals overlie a "support structure" disposed alongside the chip, rather than the chip itself. See, e.g., Fig. 16 of the drawings, in which terminals 8372 are mounted on a "securement element" 8361 which incorporates a compliant or compressible layer 8303 (specification, p. 44, lines 10 et seq.). New claims 69, 70 and 71 restate the concept of a "layer of compressible material" disposed between terminals and the chip (claims 69 and 70) or between the terminals and a "support structure" (claim 71). New claim 72 refers to the use of a support structure in the form of a ring; see element 8307, fig. 19, and page 45, lines 13 et seq. in the specification. Use of an elastomer as the compressible material of the compliant layer is set forth, e.g., in the paragraph bridging pages 32-33 of the specification. The "substrate" referred to in

12

claims 74-77 is shown, e.g. at element 20 of Figs. 1 and 2 and the corresponding elements in other embodiments.

New Claims 78-80 depend from existing claim 15. The concept of a "tape" including plural components is set forth in the specification at, e.g., pp. 25-26 and 42-43 of the specification. Claim 20 has been amended to delete the "securement" section limitation, which has been relocated to claim 21. New claim 66 finds support at, e.g., page 10, line 3 of the specification.

An information disclosure statement is transmitted herewith. This information disclosure statement consolidates the references cited in the parent cases, and in other related United States and foreign cases of applicant. The Examiner is believed to be familiar with many of these references. Notably, although Matsumoto U.S. Patent 4,893,172 and related Noro et al. U.S. Patent 5,086,337 illustrate certain structures including flexible leads, these references are not believed to show either a "flexible" sheetlike element; or a sheetlike element "bearing" on any surface of a chip; or a "compliant" or "compressible" layer disposed between the terminals and the chip or support structure. Saito U.S. Patent 4,878,098 shows conductors in a "fan-in pattern", but does not show either a sheetlike element which is free to deform, or a compressible layer disposed between terminals and a chip; or a separately formed "component for assembly to" a semiconductor chip. Thus Saito's lead structure is formed in situ on the chip itself. The so-called "tape carrier" of Niki et al. U. S. Patent 4,967,261 is not seen as having either "terminals" on its central portion 3f (fig. 2a) or a compliant layer. Carey et al. U.S. Patents 5,289,346 and 5,379,191 show certain structures including a flexible tape having leads with a "fan-in" configuration and a layer of an elastomer. However, these patents are not believed to be legally available as prior art against the present claims. Many of the present claims are fully supported by applicant's United States Patent Application 586,758, filed September 24, 1990, i.e., more than six months before the earliest filing date alleged for the '346 patent.

The Examiner's attention is further respectfully directed to Higgins, III et al., U.S. Patent 5,029,325. In particular, see the "TAB tape" device, referred to as a "translator", and see also the "compliant buffer 36 disposed between translator 30' and die 10" (col. 2, lines 62 et seq.). This reference apparently has a filing date of August 31, 1990, before applicant's earliest filing date. However, the Higgins '325 patent is not believed to be legally available as prior art against the present claims. Counsel is presently preparing declarations pursuant to 37 CFR 1.131 to demonstrate that applicants are entitled to a date of invention prior to August 31, 1990. If the present case comes up for action by the Examiner before such declarations have reached the file, the Examiner is respectfully requested to telephone undersigned counsel.

As it is believed that all of the present claims distinguish over the art of record, favorable consideration and allowance are respectfully requested.

Respectfully submitted,

LERNER, DAVID, LITTENBERG,
KRUMHOLZ & MENTLIK



MARCUS J. MILLET
Reg. No. 28,241

600 South Avenue West
Westfield, NJ 07090
Tel: (908) 654-5000
Fax: (908) 654-7866